



Environment and Natural Resources Trust Fund

2021 Request for Proposal

General Information

Proposal ID: 2021-112

Proposal Title: Mapping Existing Structural Practices In Vulnerable Agricultural Landscapes

Project Manager Information

Name: Matt Drewitz

Organization: Board of Water and Soil Resources

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Project Basic Information

Project Summary: This project fills a knowledge gap by creating a spatial dataset of structural agricultural best management practices (BMPs) that contributes to effective BMP adoption and placement on the landscape.

Funds Requested: \$190,000

Proposed Project Completion: 2023-06-30

LCCMR Funding Category: Small Projects (H)

Secondary Category: Foundational Natural Resource Data and Information (A)

Project Location

What is the best scale for describing where your work will take place?

Region(s): NW, SW, SE,

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

During the Project

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

This new dataset fills a knowledge gap and provides information that contributes to improved environmental outcomes by informing watershed management goals for agricultural BMP adoption and placement so BMPs are installed where they provide the most benefit. Soil erosion continues to impact soil productivity and sustainability, water quality and sedimentation in streams and rivers. Through Watershed Restoration and Protection Strategies (WRAPS) and the One Watershed One Plan (1W1P) process, we've identified a need to better quantify existing conservation practices present on the landscape in order to improve models and 1W1P implementation. BWSRs eLINK database contains nearly 40,000 records of BMPs from agricultural, urban, and wastewater practices, but we are finding this is just fraction of the actual BMPs that exist. Currently, Minnesota does not have a consistent database of existing structural agricultural practices, but State's like Iowa do have this type of information. This LCCMR proposal would be a phase 1 project and would only target areas with steepest slopes within the agricultural zone of Minnesota. Three areas would be focused on: Mississippi-Winona watershed in the Driftless zone in SE MN, Coteau des Prairies (Buffalo Ridge) in SW Minnesota, and the glacial Beach Ridge in NW Minnesota.

What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.

This project builds upon existing methods developed by Iowa State University through the Iowa BMP Mapping Project (<https://www.gis.iastate.edu/gisf/projects/conservation-practices>) to map structural BMPs in these agricultural landscapes. The purpose of this project is to create a comprehensive database of existing BMPs to inform watershed modeling and effective BMP placement. This project fills a data gap existing in landscapes vulnerable to soil erosion. Data from this project helps local governments assess existing conditions in the field and determine areas to focus landowner financial assistance for maintenance of existing practices and the implementation of new structural practices. This project will consist of 3 components: 1) BWSR will work with staff and students in the MNSCU system to map structural agricultural practices (sediment basins, pond structures, waterways, and terraces) using LiDAR and aerial image data, 2) BWSR will work with local soil water and conservation district, county, or watershed district staff in the focus areas to review the maps and assist with field validation, and 3) BWSR will work with an inter-agency team to develop a long-term plan to update this data and the efficacy of collecting this information Statewide in the future.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

This data will be used in the following ways: 1) Inform the development of WRAPS and watershed planning implementation (1W1P) to improve water quality actions and goals, 2) Use in watershed based hydrologic models to better predict water quality and quantity impacts, 3) Provide a truer picture of the number of conservation practices on the landscape, as current statewide databases underestimate the number of BMPs present, 4) Use by local, State, and Federal governments in responding to disasters caused by floods and extreme rain events, and 5) Training for local partners on using the data for water quality purposes.

Activities and Milestones

Activity 1: Mapping of Agricultural Structural BMPs

Activity Budget: \$150,000

Activity Description:

This activity will include working with staff and students at one or more Universities within the State of Minnesota to complete the mapping work for this component of the project. BWSR has consulted with Winona State University, which has done similar work in the Root River watershed. First, review existing mapping protocols and develop a specific Minnesota protocol for mapping structural agricultural BMPs. Second, develop an action plan and provide preliminary mapping and geographic information system (GIS) products to BWSR and local government partners. Third, University staff will make adjustments and corrections to the data based on feedback from reviewers and field validation work. All GIS data will be provided to BWSR meeting State metadata standards set forth by MnGEO. GIS data (ESRI geodatabase) will be shared with local partners and posted to MnGEO spatial commons if deemed appropriate.

Activity Milestones:

| Description | Completion Date |
|--|-----------------|
| Develop Minnesota Based BMP Mapping Protocol | 2021-12-31 |
| Complete Preliminary Mapping Products for the 3 Focal Geographic Areas | 2022-12-31 |
| Deliver Final BMP Mapping Products | 2023-05-31 |

Activity 2: Field Validate BMPs and Review BMP GIS Datasets

Activity Budget: \$30,000

Activity Description:

BWSR will contract with three local government partners in the focus areas of this project to: 1) Review the GIS data created, 2) Conduct a windshield survey of these practices in the field to validate locations and provide quality control to the attribute data, and 3) Provide comments back to BWSR and the selected University contractors on edits that need to be made to the data.

Activity Milestones:

| Description | Completion Date |
|--|-----------------|
| Review GIS datasets | 2023-01-31 |
| Complete Field Validation Work | 2023-04-30 |
| Provide Comments and Edits to the BMP GIS Data | 2023-05-31 |

Activity 3: Disseminate Information and Develop Long Term Plan

Activity Budget: \$10,000

Activity Description:

BWSR Staff will meet with University and local government partners to review preliminary and final BMP GIS datasets. BWSR will solicit comments from all partners involved and develop lessons learned from the project. BWSR will developed a Legislative Report to LCCMR on the feasibility and costs of applying the methods developed through this project and conducting mapping work statewide.

Activity Milestones:

| Description | Completion Date |
|--|-----------------|
| Preliminary Meeting with Local Partners | 2021-11-30 |
| Final Meeting with Partners on Completed Data Products | 2022-06-30 |
| Develop DRAFT Legislative Report | 2022-09-30 |
| Legislative Report Completed and Submitted to LCCMR | 2023-06-30 |

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this be funded?

Project data will help improve watershed models, result in better placement of BMPs, and cost effectively improve water quality and environmental benefits. BWSR will determine whether protocols developed for mapping the focus areas in this project are applicable to all agricultural regions in the state. This project will give a better sense of the costs to do this work on a Statewide basis and BWSR will develop a future plan for adopting this work Statewide. BWSR will be in communication with State leaders working on collecting new LiDAR in the future, which would enhance future data collection efforts.

Project Manager and Organization Qualifications

Project Manager Name: Matt Drewitz

Job Title: Matt Drewitz, BWSR Measures and Outcomes Coordinator

Provide description of the project manager's qualifications to manage the proposed project.

Matt has worked as a project manager in State Government for nearly 20 years and has managed numerous contract projects. He has managed 3 previous LCCMR projects in his career. Matt has a Bachelor of Arts in Biology from Gustavus Adolphus College and a Masters in Environmental Science from Minnesota State University Mankato. Matt's current position (2016-present) is the Measures and Outcomes Coordinator for BWSR, where he manages numerous state contracts (University/private sector) for work with BWSR's eLINK contract database system, Tillage and Erosion Survey Project, and the PTMApp conservation targeting decision support software. He also works on providing inter-agency support for development of Statewide Plans such as the Clean Water Fund Performance Report and the Minnesota Nutrient Reduction Strategy. Between 2006 and 2016, Matt was a Hydrologist (Clean Water Specialist) for BWSR and helped manage numerous grant projects. From 2000-2006, Matt was an Analyst with the Minnesota Department of Agriculture and managed numerous contracts with the University of Minnesota.

Organization: Board of Water and Soil Resources

Organization Description:

The Minnesota Board of Water and Soil Resources (BWSR) consists of 20 members. Members can be citizens, state agency staff, or local government representatives that deliver BWSR programs. The board is the state's administrative agency for 90 soil and water conservation districts, 46 watershed districts, 23 metropolitan watershed management organizations, and 80 county water managers. The board sets a policy agenda designed to enhance conservation delivery through local government partners. Board members, including the board chair, are appointed by the governor to staggered four-year terms.

Because 78 percent of the state's land is held in private ownership, BWSR's focus on private lands is critical to attaining the state's goals for clean water, clean air, and abundant fish and wildlife. These working lands - Minnesota's farms, forests, and urban areas - contribute greatly to the production of environmental goods and benefits including cleaner air and water, fish and wildlife habitat, and preservation of open spaces. In order to improve water quality and fulfill BWSR's missions to work with private lands, BWSR is proposing this project that will help provide data and analysis to our local partners to solve real world environmental issues.

Budget Summary

| Category / Name | Subcategory or Type | Description | Purpose | Gen. Ineligible | % Benefits | # FTE | Classified Staff? | \$ Amount |
|---|--|--|---------|-----------------|------------|-------|-------------------|------------------|
| Personnel | | | | | | | | |
| Matt Drewitz, BWSR Measures and Outcomes Coordinator | | Project Manager and Lead (this project is a new effort and above and beyond the employee's scope of work). | | | 25% | 0.1 | X | \$10,000 |
| | | | | | | | Sub Total | \$10,000 |
| Contracts and Services | | | | | | | | |
| University Staff from MNSCU or U of M (TBD) | Professional or Technical Service Contract | This work will include providing funds for a lead investigator, along with undergraduate or graduate students to assist with the mapping work. This contract will follow MMB's contracting guidelines. | | | | 1.5 | | \$150,000 |
| Soil Water Conservation District, County, or Watershed District Staff (TBD) | Professional or Technical Service Contract | BWSR will contract with one local government entity in each of the 3 focus areas for the project to review data and conduct field validation. This contract will follow MMB's contracting guidelines. | | | | 0.3 | | \$30,000 |
| | | | | | | | Sub Total | \$180,000 |
| Equipment, Tools, and Supplies | | | | | | | | |
| | | | | | | | Sub Total | - |
| Capital Expenditures | | | | | | | | |
| | | | | | | | Sub Total | - |

| | | | | | | | | |
|-------------------------------------|--|--|--|--|--|--|--------------------|------------------|
| Acquisitions and Stewardship | | | | | | | | |
| | | | | | | | Sub Total | - |
| Travel In Minnesota | | | | | | | | |
| | | | | | | | Sub Total | - |
| Travel Outside Minnesota | | | | | | | | |
| | | | | | | | Sub Total | - |
| Printing and Publication | | | | | | | | |
| | | | | | | | Sub Total | - |
| Other Expenses | | | | | | | | |
| | | | | | | | Sub Total | - |
| | | | | | | | Grand Total | \$190,000 |

Classified Staff or Generally Ineligible Expenses

| Category/Name | Subcategory or Type | Description | Justification Ineligible Expense or Classified Staff Request |
|---|---------------------|--|--|
| Personnel - Matt Drewitz, BWSR Measures and Outcomes Coordinator | | Project Manager and Lead (this project is a new effort and above and beyond the employee's scope of work). | Classified : Request to have Matt Drewitz expense part of his time to develop the long term analysis, disseminate data to local partners, and develop report on the feasibility of statewide adoption of this work. |

Non ENRTF Funds

| Category | Specific Source | Use | Status | Amount |
|------------------|--|---|----------------------------|-----------------|
| State | | | | |
| Cash | Clean Water Funds or BWSR State Cost Share Funds | Future projects implementing structural BMPs in these three geographic zones for this project will be considered match. These project locations will be utilized for quality control. | Potential | \$60,000 |
| | | | State Sub Total | \$60,000 |
| Non-State | | | | |
| | | | Non State Sub Total | - |
| | | | Funds Total | \$60,000 |

Attachments

Required Attachments

Visual Component

File: [e0ea601d-fe3.pdf](#)

Alternate Text for Visual Component

This map provides an example of the GIS products. One visual example is from Iowa and the other from a pilot project in Yellow Medicine Watershed.

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Does your project have patent, royalties, or revenue potential?

No

Does your project include research?

No

Does the organization have a fiscal agent for this project?

No

Project Title: Mapping Existing Structural Practices in Vulnerable Agricultural Landscapes

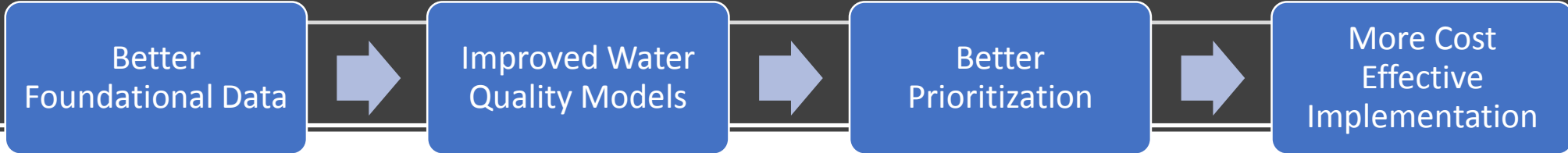
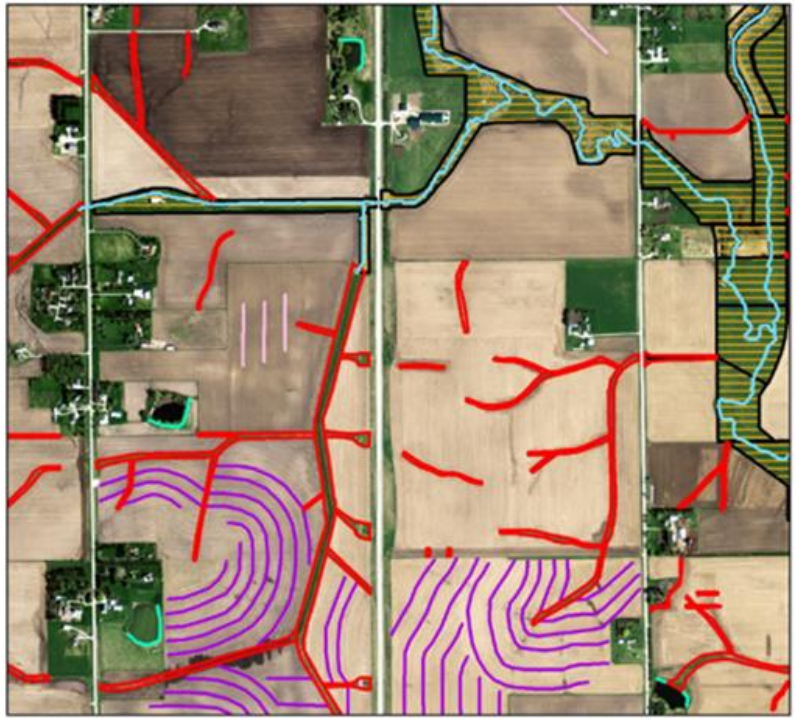


Figure 1 (right): Samples of BMPs mapped in Iowa. Iowa Legislature funded this work through Iowa State University.



Digitized Conservation Practices in HUC 12 Watershed 0708050905 in Black Hawk County, Iowa

| Digitized Conservation Practices |
|----------------------------------|
| Riparian Areas |
| Grassed Waterway |
| Pond Dam |
| Terrace |
| Water and Sediment Control Basin |
| Stream Reach |

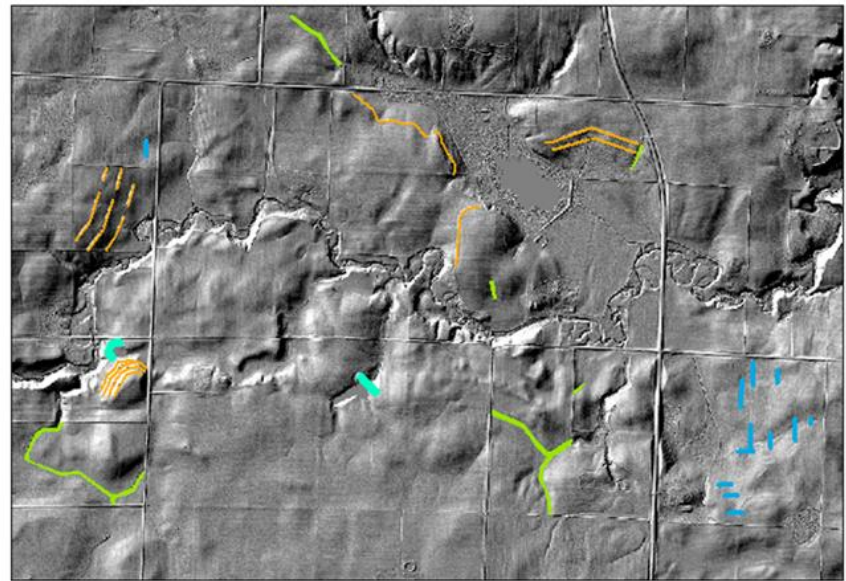


Figure 2 (above): Sample of BMPs mapped in the Yellow Medicine Watershed in Lincoln County, Minnesota

